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NEW CONCEPTS IN GLOBAL WARGAMING

by

James John Tritten

Kleber S. Masterson, Jr.

May 1987

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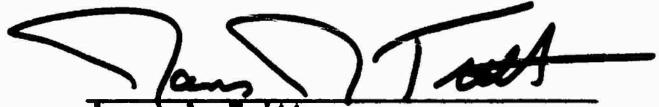
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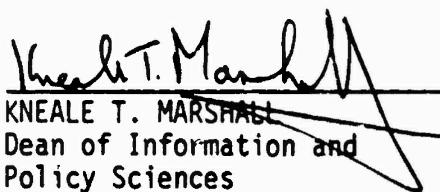
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Report addresses resurgence in wargaming and new techniques used to address
complex political-military issues. Relationships between gaming and analysis are
examined. Benefits, opportunities, and drawbacks of gaming addressed.
Requirements for Control Team in modern computer-assisted State and Path games
and seminar games discussed. Authors conclude with the value of modern
simulation techniques.

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New Concepts in Global Wargaming

James J. Tritten
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Today, when the call for defense reform is often made, when there is a wide ranging debate on how to fight or deter war, and when the services and the CINCs are working intensely at developing optimum plans for acquiring and integrating new technologies into out force structure, gaming is undergoing a resurgence at the strategic, operational and tactical levels. Not only are the traditional wargaming systems, such as that at the Naval War College, undergoing major modernization and increased usage, but new concepts, methodologies and systems for gaming are being developed and used to examine issues not heretofore addressed. The complexities of the issues we face today and their intractability to solution with conventional analytical tools, has led to the development of high-level, fast-running global gaming systems and new gaming methodologies which are helping military planners develop powerful insights into future force balance, deterrence, and war fighting issues. We now have enough experience with these recently developed concepts to assess their usage and potential.

Among the things that are being rediscovered is that wargaming can be used simultaneously as an educational and an analytic process that can help us to prepare better for the deterrence of war and to fight better if deterrence fails. A war game is a simulation, a theoretical conflict, and of course, not reality. But at its best, gaming can act as a bridge between artifice and actuality in ways that are quite compelling and perhaps not initially recognized. Wargaming can allow new theories and concepts to be tested and can stimulate insightful and novel thinking about various issues. It can also

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promote a common understanding of the problems and may even promote a consensus on ways to meet those problems.

In some cases, traditional analytical methodologies have seemed to be inadequate to the complexity of the task or to the almost unbounded degrees of freedom of today's problems. This is not surprising. Multilateral defense issues are more difficult, existing and potential technologies more complex, and the threats more sophisticated. In widely differing theaters, military commanders must be prepared to threaten to use or actually use a simultaneous mix of nuclear, conventional and unconventional forces. Future military operations will likely encompass increasingly sophisticated combined arms use of sea, land, air and space assets to achieve strategic, operational and tactical objectives.

Complexity is compounded by the different suggested strategies, logistical difficulties, competing demands for resource allocation, varying response times for the different types of forces and the very rapid tempo of modern warfare. Traditional analysis techniques may founder in the face of these complexities, but in many cases wargaming can help provide an answer. Gaming allows players to address issues that might otherwise be out of analytical reach with by allowing them to "experience" future conflict.

However, for wargaming to address these types of issues adequately -- so that we are ready to deter war or alternately fight better -- we have to have more sophisticated simulations and better gaming mechanisms, and it is on these that the remainder of our discussion focuses.

Two major approaches have been followed to develop the needed improvements. In one approach, highly aggregated global games have been designed that, in a single architectural context, encompass land, sea, air and space systems; unconventional, conventional, chemical and nuclear conflict;

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logistics from industrial base through lift through material flow to the fronts; and, global scale with a theater-level or sub-theater "zoom lens." These games, initially designed for and utilized as low-cost manual board games, are now supported by PC-based computer models. New gaming methodologies have been developed and proven with these systems, and they have been utilized extensively by a variety of organizations for analysis and education.

The second key new approach to wargaming has been the development of gaming systems which make extensive use of state-of-the-art techniques in artificial intelligence to support automated play of some or all of either side in the game, as well as that of other parties. This gaming system will allow a much wider range of "what-if" questions to be answered during game play or subsequent analysis.

In both cases, games covering the conduct of one or more global wars can be conducted by teams ranging from a few to two dozen players on each side, in as little a few to as much as twenty hours of gamer time. Further, these games can be taken to the players instead of the players having to come to the games. These new techniques and technologies are proving capable of enhancing the benefits of gaming while reducing some of its traditional limitations.

A key concept of new gaming systems as they have evolved is that the players communicate in their own operational language and need have no knowledge of gaming to play effectively. The game's models are so designed that experienced controllers can easily translate everything that the players want to do into model inputs and the results can be readily interpreted by the controllers and explained to the players in operational terms. The controllers ensure that a credible war is "fought" in all cases, responsive to the explicit and implicit direction of the players, and that all relevant,

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physically achievable actions directed by the players are reflected in the game calculus.

These new techniques and technologies stem from two basic assumptions about gaming   First, games should be used as a mechanism to examine issues; therefore, they will focus more on the process than the outcome of an individual campaign or war. In other words, why something happened is often more important than what happened in the game. The gaming experience can be used to flesh out what are otherwise paper concepts. For example, playing alternative and identical wars in which only one key variable is changed might allow players to focus on the impact of the land campaign in Central Europe from swinging or not swinging theater forces.

Using a game as a source of stimulation, players can be asked to address questions and issues of interest. A new technique that has proven to be very powerful is to have players develop majority and minority views on key questions - together with the rationales for their views - early in each game, and then periodically during the game have them reexamine the questions, iteratively improving the responses based on events in the game, on conversations with other players, and on their own reflection on the questions.

A game thus can be an integrative mechanism between the viewpoints of a wide variety of players and what has happened in a simulation. Gaming as such a tool to explore issues and stimulate thought is an excellent mechanism that can attract an analyst or policy decision maker who otherwise might not have an opportunity or take the time to address issues and stimulate thought is an excellent mechanism that can attract an analyst or policy decision maker who otherwise might not have an opportunity or take the time to address issues in such an interactive, integrating fashion.

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Our second basic assumption is that, while game can assist in exploring questions of strategy, operational art, tactics, human behavior, etc , a single game cannot objectively prove or disprove anything; hence it can be less threatening than a paper or briefing. Players can report what they did as a group in the game, in the context of the situation of that particular game, without being vulnerable to personal criticism. This allows the elements of the decision and of the decision-making process to be examined objectively. Using the example from above, a game cannot "prove" that swinging or not swinging out of area forces can make a strategic difference (or not), but it can help players learn for themselves what factors bear most heavily on any decisions to do or not to do this. Players will have their assumptions challenged by events and by other players, and generally they take something away with them after a game that leads to further thought and substantive analysis.

Although we believe wargaming is not a decisive tool, it is one that can encourage participants to broaden their perspectives and develop new insights on issues. In putting teams together for these types of games, it has been useful to strive for representation from a wide spectrum of groups which have an interest in the issues being addressed. Further, another powerful technique has been to conduct play on a not-for-attribution basis. By doing so, one can stimulate thinking and expose players to a broader range of perspectives on the issues being examined. Often in such an environment, unconstrained and innovative thinking occurs. Further, the technique of focusing player attention on coherent statements of majority and minority views, and the rationale for them, helps ensure that good ideas are refined and are not lost.

We find games are an educational mechanism for illuminating and understanding concepts that are difficult to grasp in the abstract but become clearer when players resolve complex related issues. A good example is the asymmetry that Blue players observe when they see Red players approaching game tasks in a logical top-down manner making the links obvious between doctrine, strategy, operational art, and tactics. Games also allow the Blue player to observe that although most Red players, and perhaps the Soviet Union, are better at pre-war planning, they are not necessarily better at execution.

As noted above, games can be used to focus players on a series of questions of interest to a sponsor within the context of particular war or campaign. In essence, such games are an exercise in experimental political-military research under structured conditions. Simple, rapid calculus PC-based models can serve as a high level integrator of fast-moving, broadly scoped events and permit consideration of a wide variety of war fighting, planning and logistical issues. Without entering into the "black box" of operational research, players can develop policy, accomplish mobilization or contingency planning, and simulate joint or combined military operations. New artificial intelligence concepts can parametrically explore possible political-military outcomes at the global through theater levels and further integrate the calculus of all forms of warfare.

The point of using artificial intelligence concepts is not to do away with the human element, but to elucidate it better. Another advantage of these systems is that they permit the entire play of the game to be automated, thus achieving the ability to run rapidly hundreds of excursions for validity testing, contingency, and sensitivity analysis. We have high hopes for using such systems both to conduct games and to conduct in-depth analyses of previous less-automated gaming efforts.

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A major problem of all wargaming is to represent accurately Soviet behavior and an asymmetrical world view. Simply put, players must deal with the radical differences in political objectives and military style that competing nations have. This problem arose during the Vietnam era when the lack of players who could simulate or represent the North Vietnamese resulted in misleading game results.* We need to get our simulations to represent better the asymmetries between perspectives and methods of warfare of nations so that we do not simply have BLUE players playing RED as BLUE would play. Again, artificial intelligence concepts can allow the software to capture the government's best view of the expected behavior of the USSR and then have this model available for all users. These types of games are only possible when they fully integrate the basic game objectives, well thought out scenarios, models that are good enough and carefully selected players. There must be a very close relationship between the game sponsor and the group charged with the conduct of the game.

When this is done, games and simulations allow players to practice and refine techniques to improve our ability to deal with the Soviet Union on either specific issues like controlling escalation during a crisis, or in terms of our long-term competitive relationship. A very important objective can be attained when we do this in a game: players can be forced to deal with outputs (what they are trying to make happen) rather than only inputs or the adjudication mechanism. Thus, a war termination game may help players focus on the identification of asymmetrical political goals of the two sides. Through that process, they might better understand the long-term competitive relationship between the superpowers and then be able to assess from a new

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* General Bruce Palmer, Jr. The 25-Year War: America's Military Role in Vietnam. (Lexington, KY; University of Kentucky Press, 1989), p. 29.

perspective the types of forces and arms control regimes that might better contribute to the management of the superpower relationship. A game is not a substitute for reality, but it can still serve as a useful mechanism that forces players to consider what types of decisions have to be made, in what order, and by whom so as to achieve a satisfactory resolution of complicated multilateral political-military issues.

One area which has been explored recently has been the use of "open," "closed," and hybrid games. In an "open" game, both sides are in the same room and can debate their moves with each other before committing themselves. In a "closed" game, they are separated and communicate only through the game mechanisms. The objectives of the game will drive its conduct. For example, if a game is to examine the employment of forces in a conventional land campaign, it may be useful to conduct it as an "open" game in which both BLUE and RED debate their options and make their moves together. This interactive process gives small player teams many of the benefits of the staffing that exists in the real world. Thus, if one side is considering an easily countered action, the other team will point out the counter, and a more robust series of moves usually results. Such a game is useful in determining possible courses of action involving a particularly complex issue that has no historical precedent and little depth in well-thought-out literature. Conversely, other situations are much better suited to "closed" games, particularly when perceptions each side has of the other appear to be much more crucial to possible outcomes and results, or when complex concepts such as preferential defense are being examined. A hybrid process which shifts from closed to open gaming can sometime achieve the benefits of both forms of gaming.

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Flexibility must also be built into scenarios. The measure of a good scenario is not how new or innovative it is, but its usefulness in getting players to address the issues of interest. The starting point of a scenario should be chosen so that the game can begin at the point where the issues to be examined become important. In many cases, that is the crisis phase, but in some games this may be well into the conflict or even (in unusual cases) after a cease fire has already taken place. Further, it is sometimes useful to allow major changes in scenario during the game itself in order to enable players to examine the issues in a way they consider most realistic or powerful. For example, during the play of a game, Control might allow teams to examine the impact of a shift of scenario from a minimal amount of initial warning and mobilization to a case where both strategic and tactical warning are given, and the resulting changes in force posture on both sides. It takes a flexible gaming system with a readily modified data base to make such flexibility possible.

Another new concept in global wargaming if the extension of the time scale of the game from the relatively short span of what are now called state names to one or more decades in path names. The former examine a given set of issues at a particular time with force structures and strategies that are set. Path games, by contrast, examine a series of policy or force structure decisions over a prolonged period -- say, ten or more years. Conflicts can be gamed, either at the end of the game or along the paths, utilizing the forces resulting from the decisions made during the path(s). Alternately, as a pre-game layout prior to the path game itself, a state game can be conducted to highlight the current perceived problem.

A key concern or gaming limitation is the tendency by some players to "game the game." Trying to figure out what actions will produce some desired

result from the game models obviously works against the purpose of a game. Although control can show players the details of models and let them control inputs directly, an alternative approach is for control to act as interpreters of their moves and reporter of results. An important role of Control, then, is to ensure that game calculus reflects "reality" as well as humanly possible, and that "gaming the game" is not rewarded.

In addition to the above role for Control, experience has shown that games can be even more effective if Control creates a "no fault" type of game. In such a game, Control takes both general and specific player orders on strategy, operational art, and tactics, and then fills in all the details necessary to cause RED and BLUE to fight well. In automated games, players can focus on functions or geographic areas of interest which the gaming system models the rest of the world. Game play benefits from having whatever aspects the players are focusing on occur in the context of the full conflict.

The real point of using models is not to emulate reality, or to force players to act out roles, so much as to serve as a device to stimulate innovative thought, and by so doing, to educate players and sponsors. Obviously, models do not predict actual outcomes, but their results must be reasonable for such a gaming effort. A preferred method is to indicate the range of possible outcomes for a given situation. Unfortunately, some people tend to believe that the results produced by a game are real and that something has been proven. They are not, and at best the results are only a reasonable first-cut test of various ideas or concepts. However, certain results (especially those that emerge over and over in similar games) should be submitted to in-depth sensitivity analysis and validation.

Flexibility and interaction are two additional ingredients that can further stimulate players and sponsors. Control can encourage players to do

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anything that is physically reasonable during the period of the game years, even to the point of "inventing" new weapon systems. The game can act as an integrative mechanism to integrate otherwise incommensurate ideas into a single calculus. At high levels of aggregation, this permits truly interesting and innovative thinking to emerge. In addition, games can be structured to prevent players from expecting that there will be a winner declared at the end of the game. Winning is irrelevant to the type of games described; the focus is issues.

Although we be⋅ ₌ve it is crucial for players to understand the game and its objectives prior to the start, no previous gaming experience is required for such seminar games. By not using role playing, team leaders instead draw on the strengths of the individuals on their teams by working as a "committee of the whole." Thus, a player familiar, say only with naval forces, does not have to role play a unified commander. What often results in a synergistic combination of player strengths and a team that is stronger than the sum of its parts.

If players do not play as official representatives of their organizations, but as individuals selected for their expertise and knowledge who are all allowed to present majority and minority views in insightful debate over the issues, it appears that they are more likely to take something back with them for further study and analysis. The fact that the "lessons learned" from a simulation can be remembered long after lectures or readings on the same subject is both an opportunity and a drawback that must be carefully accounted for by the Control team.

The techniques discussed above have been used to examine a wide variety of global conflict situations in ways not normally gamed - namely, in a combined arms approach that intergrates all forces, including allied forces,

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and both "tactical" and "strategic" forces, and that extends through all levels of conflict.

From the experiences of these types of games, we find that new observations on the nature of war are as significant an outcome as lessons about any specific individual campaign. For example, during a game, players can observe the relationships between nuclear and non-nuclear warfare that normally might not be perceived. Similarly, the use of conventional forces for political crisis response might be assessed in the light of the balance of nuclear forces more easily in a gaming environment.

Seminar games of this type can lead the Control team and experts who analyze the broader implications of game play to better prepare threat and net assessments by including dynamic measures, the complex interrelationship of nuclear and non-nuclear forces, and time as a variable. This in turn generates requirements for more robust calculations and obligates analysts to find easily understood measures that correctly describe the balance, e.g., who is likely to achieve their objectives and at what cost? Such an approach obviously involves a major shift in thinking to use outputs rather than inputs for the appropriate measure of effectiveness.

In general, we in the West must get better in thinking "RED" and understanding the Soviet use of terms, measures of effectiveness, and assessment of the correlation of forces. Gaming, as described herein, is an excellent methodology for having BLUE-oriented players come face to face with an opponent whose orientation and method of conducting warfare is not the same as his.

Games are also a good methodology for testing arms control strategies and force procurement options. They allow players to create alternative futures to see what combination might influence an opponent so that he will commit resources in a manner that is more satisfactory and less destabilizing. * Path games are specifically designed to explore such possibilities.

Gaming and simulation also offer a good vehicle to explore regional warfare and the use of military force for crisis response as it relates to the central question of superpower deterrence. The impact of the overall correlation of forces and means (and especially the strategic nuclear balance) on the use of non-nuclear forces for contingencies may be examined in such politico-military simulation. The ability to dominate the escalation ladder (vertically, horizontally, or in time) or lack of this ability can be a major area for examination in a game. War termination or even extended nuclear operations are difficult issues for most U.S. players to deal with. Games are a good device to allow humans to focus their attention on such issues.

The validity of wargaming extends far beyond the realm of defense; lawyers recognized long ago their value in moot courts; international relations educators often use U.N. simulations; and management training often includes gaming of industry competition and negotiation. Wargaming is a high-powered tool that demands careful analysis and its inevitable concentration on outputs. Gamers are forced to follow through their brainstorming and see the results. This is a great benefit because it reinforces the initial steps in the decision-making process. However, in reality there is also the danger of over-selling the results of a game; it

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* Although the authors recognize that stability, per se, is not the preferred political goal.

is a mistake remarkably parallel to over-selling the lessons of history. Games, like events in history, may be one time events, and participants should not be lulled into thinking that they are prepared for all contingencies. Nevertheless, gaming also has many of the advantages of history, with its richness of content; as such, gaming can yield insights that no other analytical or educational processes can approach.

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